Universidad Popular del Cesar

Reconocimiento de Patrones

Version 2022-2

KNN

[Capítulo 4]

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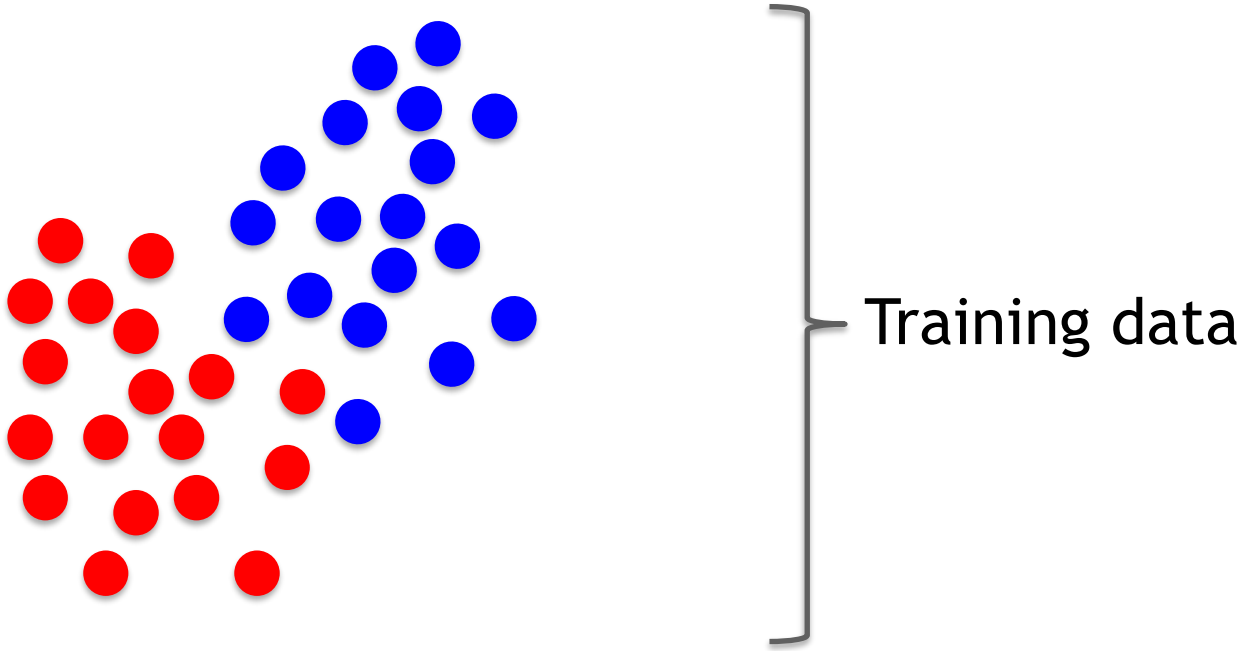
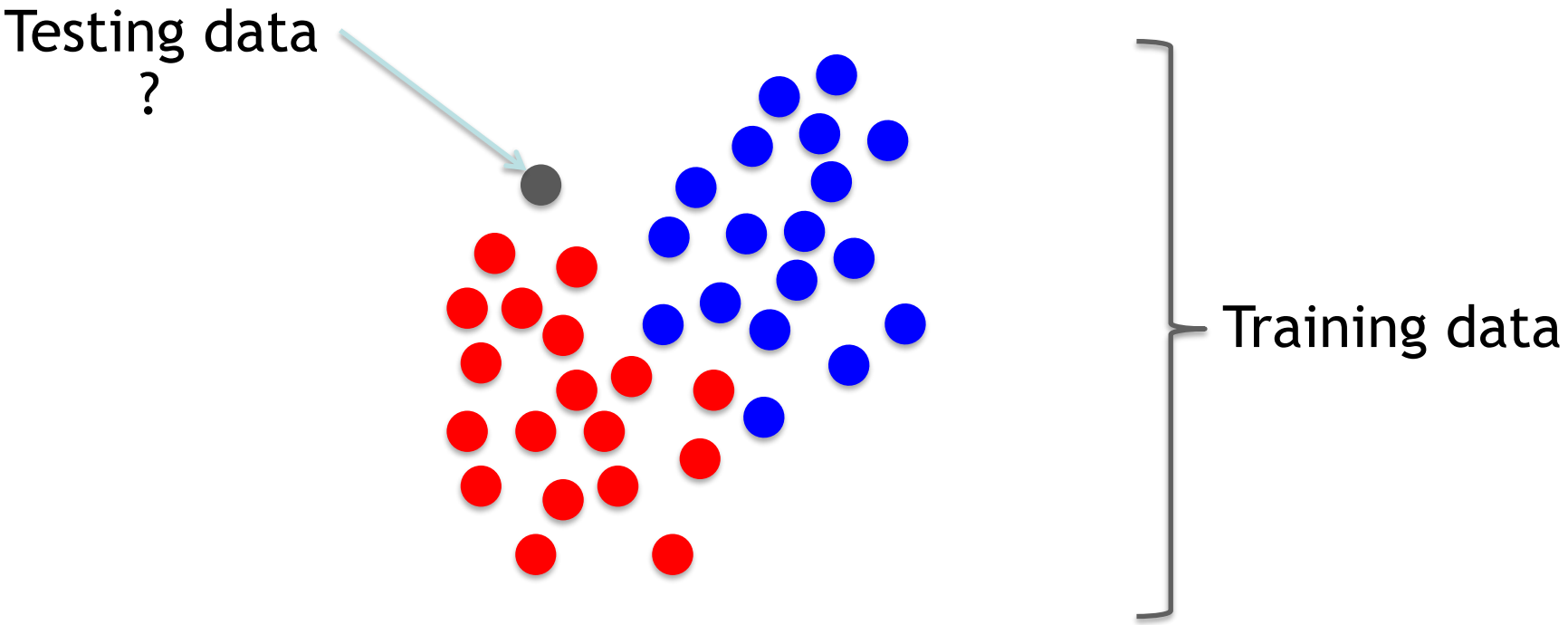
Ingenieria Electronica
Universidad Popular del Cesar

KNN: k nearest neighbors

KNN: k nearest neighbors (two classes)



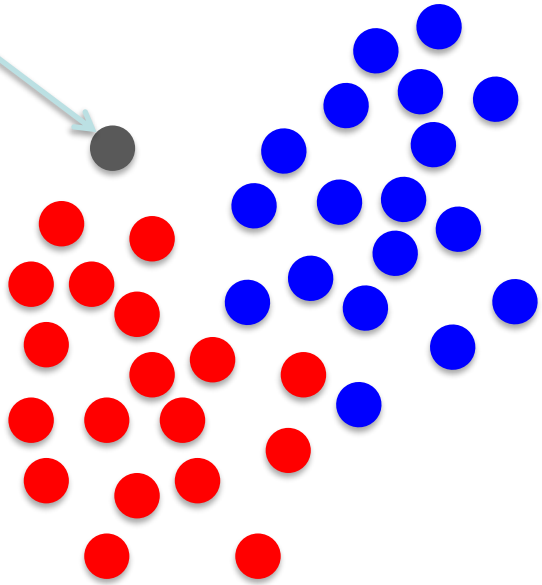
KNN: k nearest neighbors (two classes)



KNN: k nearest neighbors (two classes)

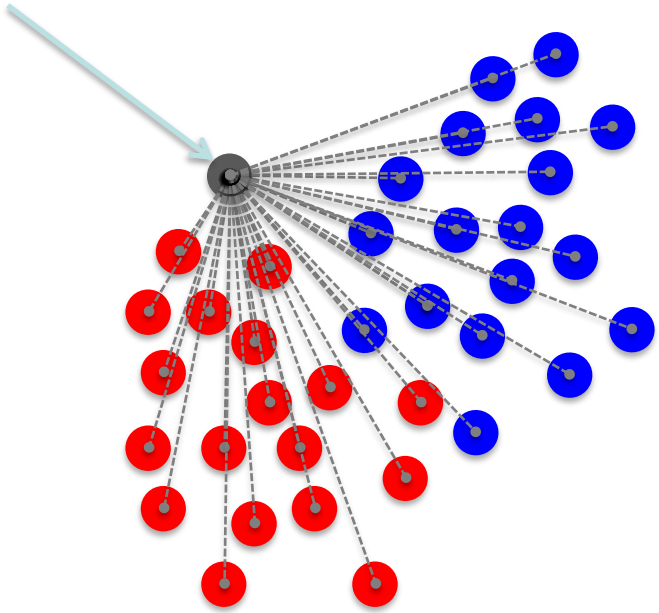
KNN Algorithm

Testing data



KNN: k nearest neighbors (two classes)

Testing data



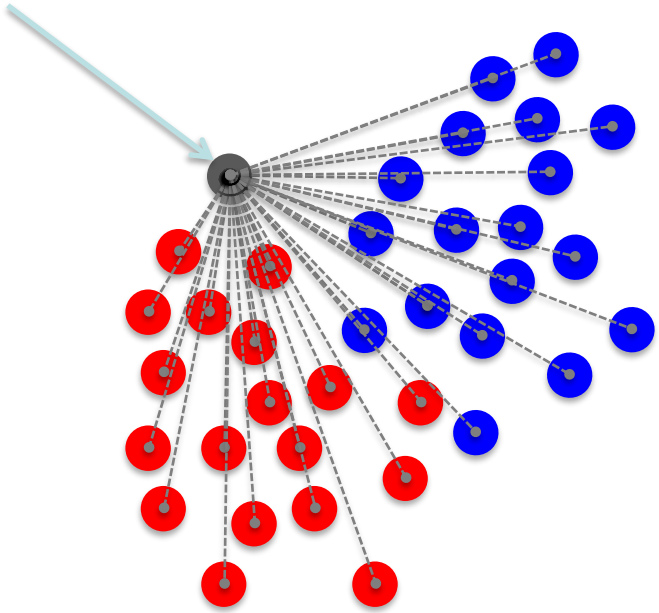
KNN Algorithm

1. Distances

0.3655
0.7015
0.6712
0.7474
0.4313
0.2880
0.0115
0.9202
0.5304
0.9362
0.5989
0.9447
0.0569
0.3264
0.6811
0.1332
0.0226
0.2435
0.0705
0.4839
0.3631
0.1090
0.6296
0.0508
0.7660
0.9544
0.6487
0.1519
0.7936
0.9525

KNN: k nearest neighbors (two classes)

Testing data



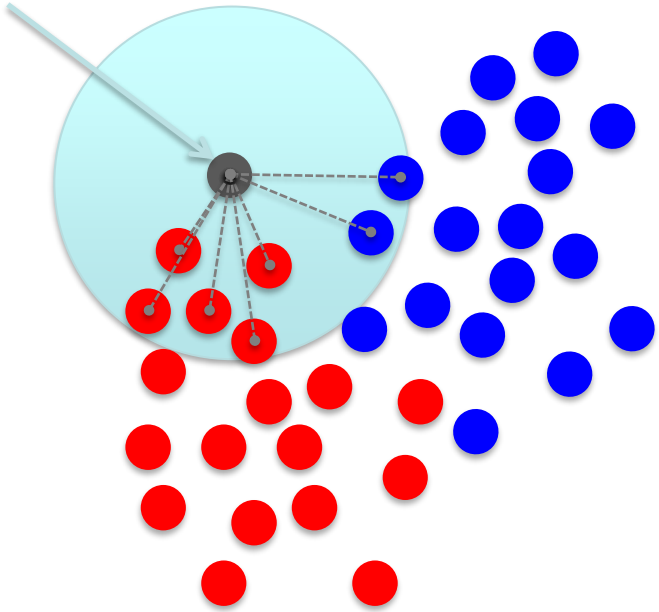
KNN Algorithm

1. Distances
2. Sort

0.3655	0.0115
0.7015	0.0226
0.6712	0.0508
0.7474	0.0569
0.4313	0.0705
0.2880	0.1090
0.0115	0.1332
0.9202	0.1519
0.5304	0.2435
0.9362	0.2880
0.5989	0.3264
0.9447	0.3631
0.0569	0.3655
0.3264	0.4313
0.6811	0.4839
0.1332	0.5304
0.0226	0.5989
0.2435	0.6296
0.0705	0.6487
0.4839	0.6712
0.3631	0.6811
0.1090	0.7015
0.6296	0.7474
0.0508	0.7660
0.7660	0.7936
0.9544	0.9202
0.6487	0.9362
0.1519	0.9447
0.7936	0.9525
0.9525	0.9544

KNN: k nearest neighbors (two classes)

Testing data



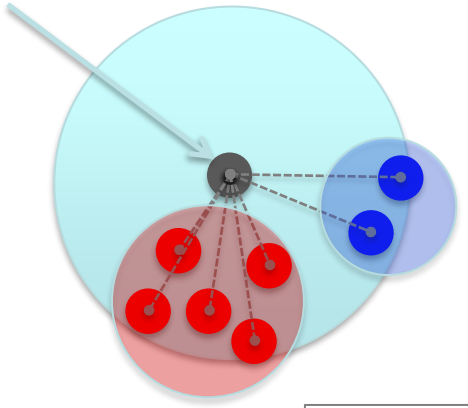
KNN Algorithm

1. Distances
2. Sort
3. Take the k nearest
   (example k=7)

0.0115
0.0226
0.0508
0.0569
0.0705
0.1090
0.1332
0.1519
0.2435
0.2880
0.3264
0.3631
0.3655
0.4313
0.4839
0.5304
0.5989
0.6296
0.6487
0.6712
0.6811
0.7015
0.7474
0.7660
0.7936
0.9202
0.9362
0.9447
0.9525
0.9544

KNN: k nearest neighbors (two classes)

Testing data



2 blue

5 red → Testing sample is red

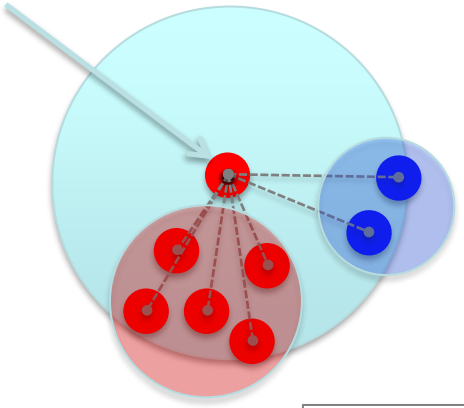
KNN Algorithm

1. Distances
2. Sort
3. Take the k nearest (example k=7)
4. Majority vote

0.0115
0.0226
0.0508
0.0569
0.0705
0.1090
0.1332
0.1519
0.2435
0.2880
0.3264
0.3631
0.3655
0.4313
0.4839
0.5304
0.5989
0.6296
0.6487
0.6712
0.6811
0.7015
0.7474
0.7660
0.7936
0.9202
0.9362
0.9447
0.9525
0.9544

KNN: k nearest neighbors (two classes)

Testing data



2 blue

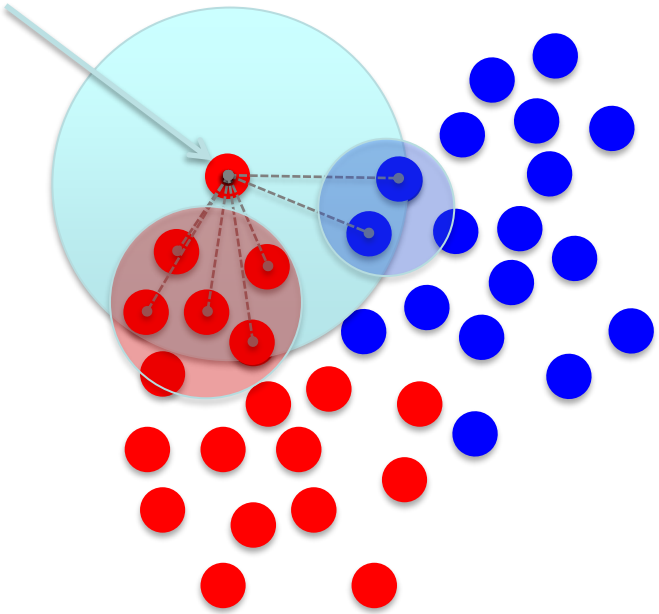
5 red → Testing sample is red

KNN Algorithm

1. Distances
2. Sort
3. Take the k nearest
   (example k=7)
4. Majority vote

KNN: k nearest neighbors (two classes)

Testing data



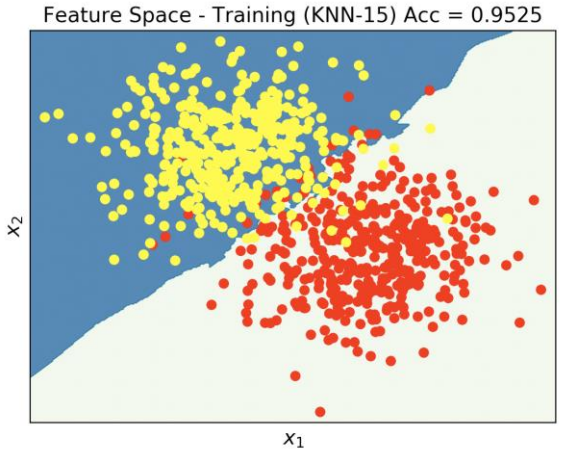
KNN Algorithm

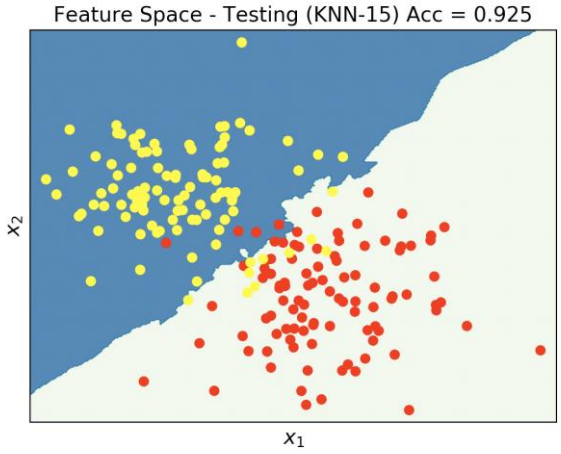
1. Distances
2. Sort
3. Take the k nearest
   (example k=7)
4. Majority vote

TRAINING

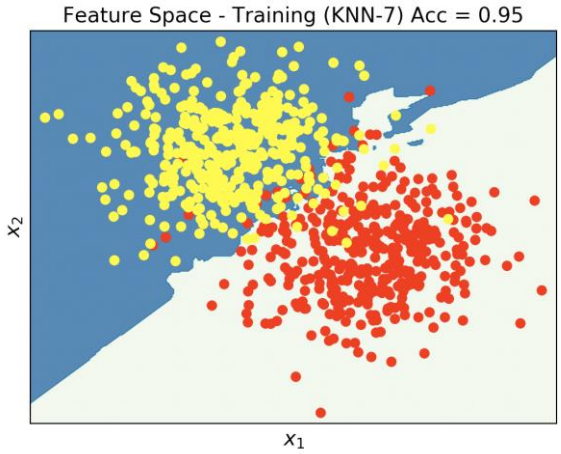
TESTING

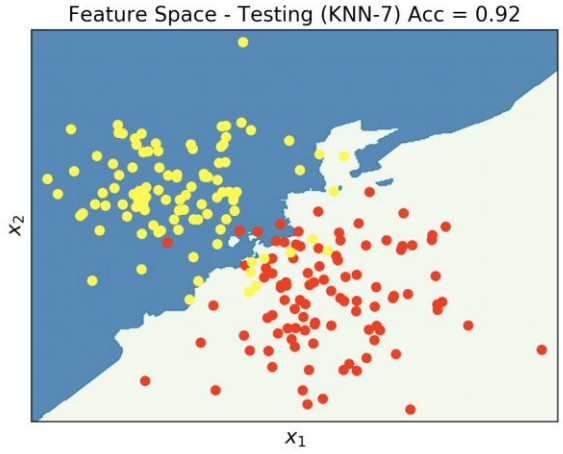
k = 15





k = 7

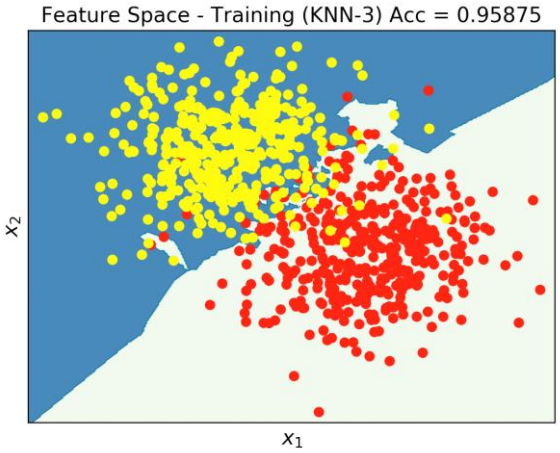


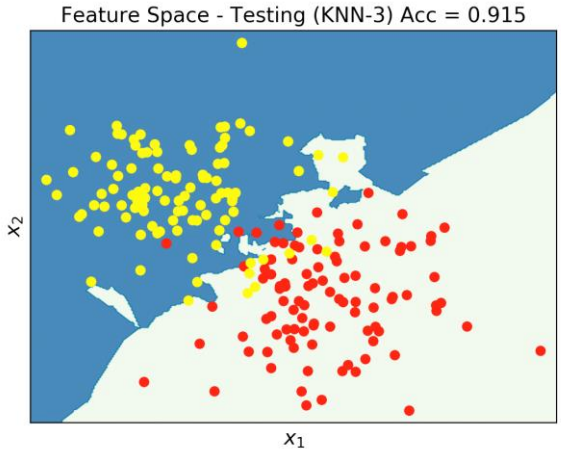


TRAINING

TESTING

k = 3





k = 1